



(Re)use of Virtual Globes for the Earth Sciences

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What are Virtual Globes?

✦ A virtual globe is a computer software that simulates a globe.

- ✦ Norkart Virtual Globe
- ✦ World Wind
- ✦ EarthSLOT
- ✦ Google Earth
- ✦ MS Virtual Earth
- ✦ TerrainView-Globe

There were a few before Google Earth, and more coming every day. But Google has the PR machine behind it and has proven the most popular.

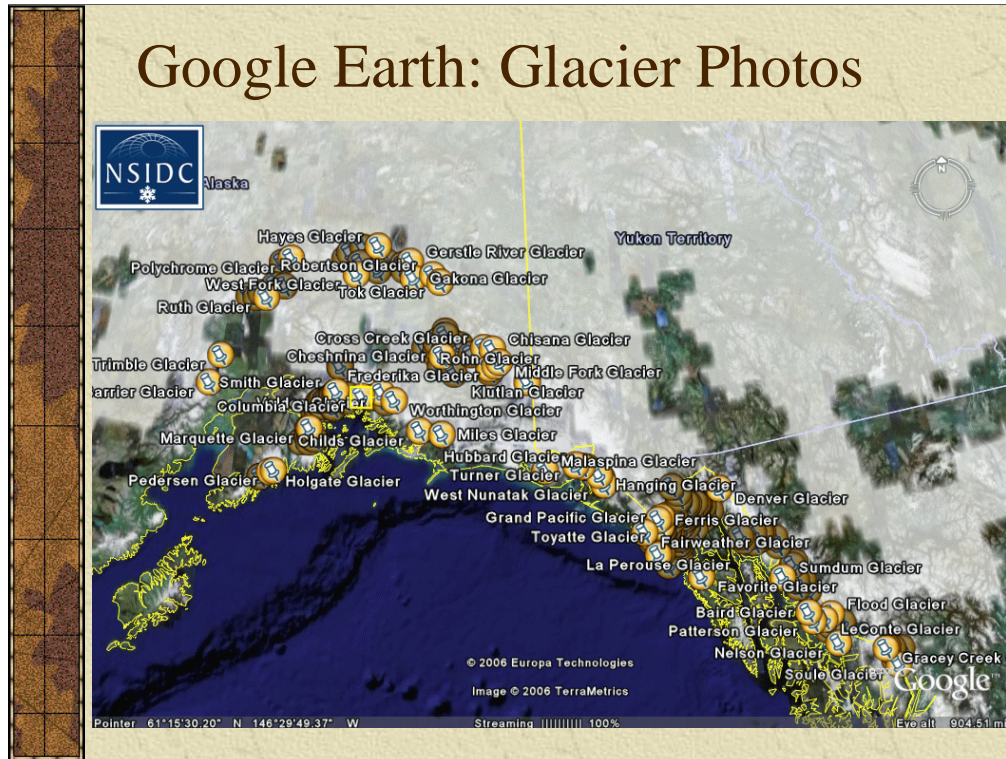
Advantages of Virtual Globes

- ✠ Ubiquitousness: They're everywhere!
- ✠ Ease of Use: User's seem to like them, and putting data into them is fairly simple.
- ✠ Cost: Generally Free.
- ✠ Feature rich – someone else has already supplied coastlines, railroads, Stuckey's etc.
- ✠ Community: Everybody is doing it – which means your data can be combined with everyone else's – Interdisciplinary Research!!!
- ✠ Neatness: They're neat!

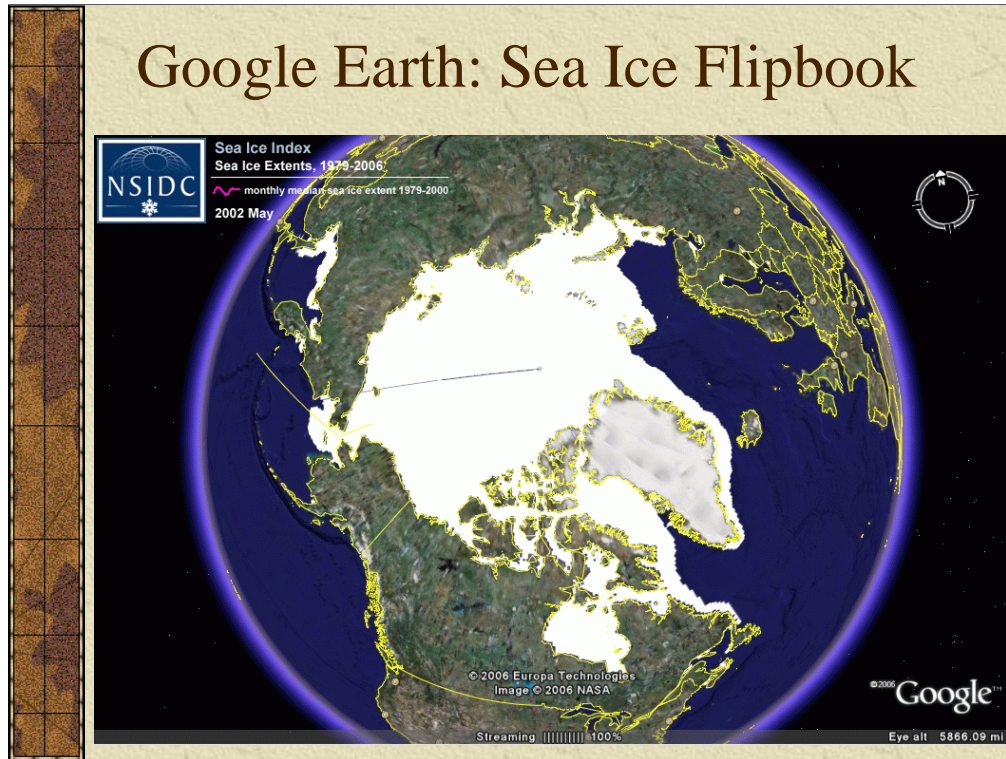
Google Earth: Snow and Ice



A few examples of the kinds of things you can do. This is our Near real-time Ice and Snow Extent (NISE) product. It gives daily ice and snow extent. We create a googleable image every day, so the user's google earth always has the latest image. Along the West coast of Canada and southern Alaska you can see a bunch of pushpins – these are glaciers.

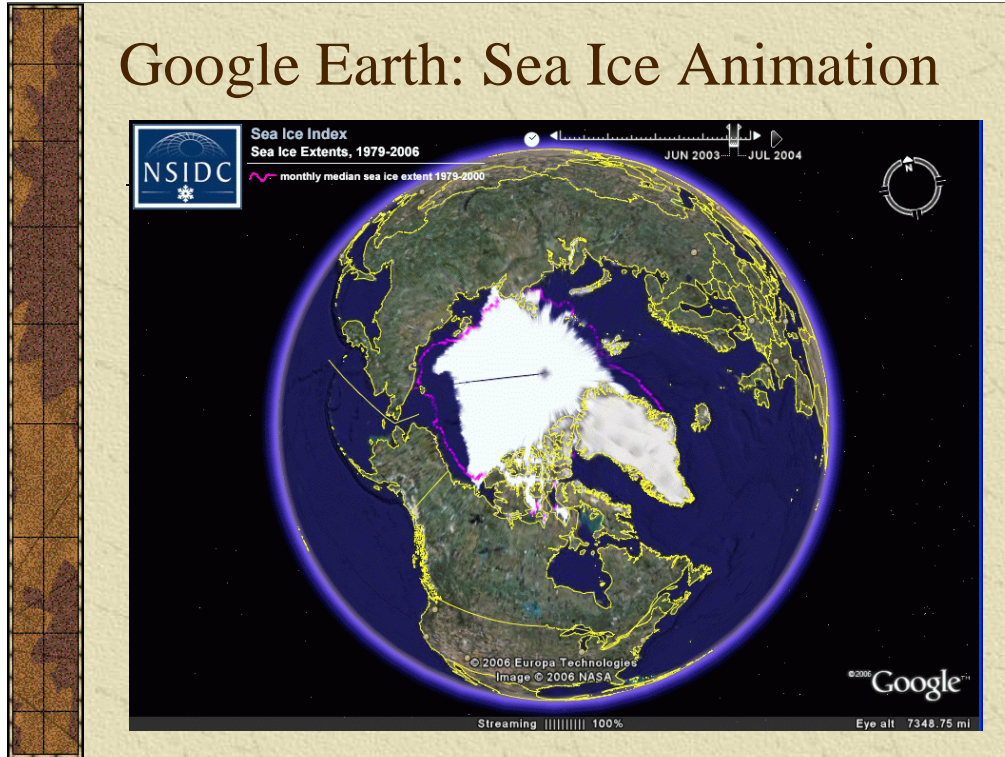


These are all glaciers for which we have historic photos on-line. Users can use Google Earth to navigate to their favorite glacier. Clicking on a pushpin brings up a thumbnail image. Full res images are available on the website which is linked.



This is our monthly sea ice extent product. We have 27 years of data. This is a flipbook animation that refreshes with the next month in the series every three seconds. You can see the date in the upper left corner – this is the sea ice for May 2002. About a week after I wrote this Google came out with animation support in v4.02

Google Earth: Sea Ice Animation



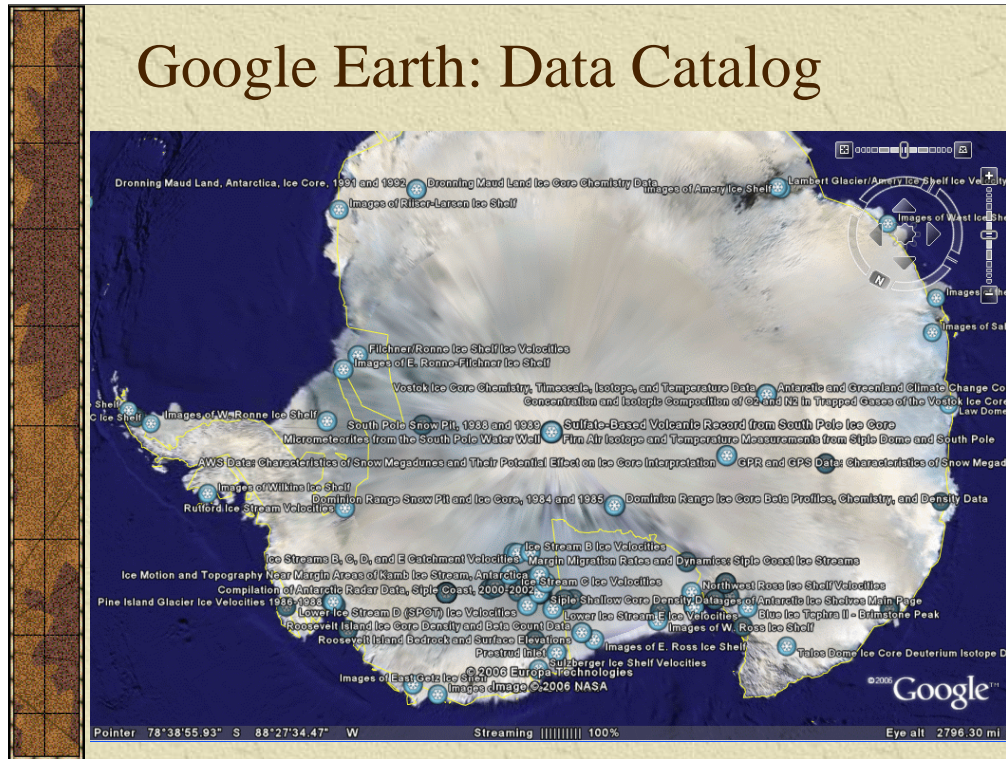
So this is a monthly sea ice extent animation using Google nifty time series capability. The little widget at the top of the image allows control over the animation. Click the arrow to animate/pause. The window expands/contracts to show more/less data at once. Other controls are accessed using the button on the left of the timeline.

Google Earth: Browse Animation



Another nice use for animation is quick-look browse. We have an interface that subsets gridded data. We figured as long as we're at it we may as well create some browse images so users can take a look at the data before they download it. Animating the browse in Google Earth just gives users a bit more flexibility.

Another thing you can do – that may or may not be a good thing – is you can fuss with the opacity. So here we have 19H, 22V, 37V, 85H, and 85V data for the same area and all the same dates. We could make one channel 50% opaque, put it on top of another channel, and animate them both. Could be interesting.



And one last example – this is my favorite. My officemate is in charge of the Antarctic Glaciological Data Center. He is not a programmer, not even remotely. He paid \$20.00 for Google Earth pro and used it to put his data catalog into Google Earth. It took him about a half a day. So he's got geographic search of his entire data catalog for 20 bucks and half a days labor.

AND ... His program manager loves it!!!

Implications to Reuse

You too can have:

- ☞ A nifty data visualization tool.
- ☞ A neat quicklook browse capability.
- ☞ A cool time series animator.
- ☞ A interactive geographic data catalog search .

By this time tomorrow!!!!

I'm sure a lot of people in the room have come up with cool things to do with virtual globes. So let's share some ideas and compare notes.